



Gannett Fleming
ENGINEERS AND PLANNERS

108175
GANNETT FLEMING, INC.
Suite 200
East Quadrangle
The Village of Cross Keys
Baltimore, MD 21210
Fax: (410) 433-6520
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November 29, 1995

Mr. Garth Connor
Remedial Project Manager
United States Environmental Protection Agency
841 Chestnut Street
Philadelphia, Pennsylvania 19107-4431

Reference: ARCS III Program
EPA Contract No. 68-W8-0037

Subject: Jack's Creek Site
Remedial Investigation/Feasibility Study
EPA Work Assignment No. 37-15-3L2W

Dear Mr. Connor:

Per your request, we are providing you with the following:

- Cost estimates for the two PRP options (2A and 3A) so that they can be included with the other alternatives developed in the Feasibility Study. These estimates are based on the design assumptions and volume calculations presented in the PRP Group's Addendum Feasibility Study Report (March, 1995). The assumptions used by the PRP Group are not necessarily consistent with those presented in the HNUS/GF Final Feasibility Study (November, 1993) nor were the calculations based on these assumptions validated. Additionally, several inconsistencies between the description of alternatives and the cost elements presented in the PRP Group document were identified. Components listed in the description of alternatives such as the consolidation of action level soils, the inclusion of a geomembrane layer within the cap, and the construction and maintenance of a stormwater/sedimentation control basin were not included in the cost elements. HNUS/GF has included a cost elements for these components.
- Recalculation of the cost estimates for Alternative 4 based on revised action levels proposed by BTAG. The estimates for limited actions were not modified since they were not affected by the revised action levels. However, a calculation error that was identified for the Disposal of Drums/Vat option was corrected.

Mr. Garth Connor
United States Environmental Protection Agency
November 29, 1995 - Page 2

Please contact me if you have any questions or comments.

Sincerely,

GANNETT FLEMING, INC.


for Frank Swit, P.G.
Project Manager

FS/RB/ks

Enclosures

cc: J. Trailie
G. Glenn
C. Yen

GF: 27307.001/1251

AR304132

TASK I

COST ESTIMATE FOR THE PRP GROUP OPTION 2A

Option 2A (presented in Section 4.2.4 of the PRP Group document) consists of the following components:

- The two waste piles (i.e., the ball mill tailings pile and aluminum dross pile) would be flattened.
- Buildings within the consolidation area would be demolished as needed based on environmental conditions.
- Soils on the Site that are in the floodplain exhibiting greater than 500 ppm lead would be excavated, and relocated outside of the floodplain with other affected soils. For purposes of cost estimating, the volume of soil to be excavated was calculated as being the top two feet of soils in all areas where surface concentrations exceed the action level. The Gannett Fleming borings and analytical data indicate that lead contamination is fairly restricted to the upper portion of the soil, and does not extent far vertically. Thus, the volume estimates are expected to be reasonably accurate. Excavated areas in the floodplain would be restored with clean fill to the original grade and revegetated.
- Soils on the Site in the upland outside the floodplain would be consolidated based on an action level of 1,000 to 3,000 ppm lead. The choice of soil lead action level outside the floodplain would be based on future leach tests and infiltration water quality modeling.
- Upland soils determined to require remediation would be consolidated in a designated potion of the Site. The consolidation area would be a portion of the Site already affected by past activities. Soils above the action level outside of the consolidation area would be excavated, and relocated to the consolidation area.
- Approximately 10,000 cubic yards of battery casings remaining onsite would be part of the consolidation area.
- Various drums currently stored onsite would be removed and properly disposed offsite.
- The flattened waste piles and the consolidated areas would be covered with a two inch layer of crushed limestone. The limestone blanket would serve to neutralize the pH, and supplement the alkalinity of any precipitation that might infiltrate through the cap, thereby providing treatment to the underlying material.
- The waste piles and consolidation soils would than be covered with a multi-layer cap, consisting of the elements discussed under Option 1B. The barrier layer would be composed of a geomembrane, such as HDPE, or geosynthetic clay. No underliner would be installed below the waste piles or consolidation area.

- Stormwater controls would be installed to divert stormwater from the covered piles and consolidation area, with stormwater/sedimentation control basins to be constructed at the edge of the upland/floodplain. Thus, primary stormwater controls would be located outside the floodplain, to promote long-term reliability. The stormwater/sedimentation control basins would be designed and installed in a manner which meets appropriate State of Pennsylvania requirements, and they would be equipped with outlet works which allow settlement of entrained sediments. These sediments, in turn, would be periodically collected and removed from the basins.
- Contaminated sediments in targeted areas of Jack's Creek would be removed and either capped onsite or disposed offsite. Based on the Gannett Fleming test results, the target area would consist of sediment directly adjacent to the Site that has been washed into Jack's Creek and contains over 500 ppm of lead. For the cost estimate, it was assumed that the sediments would be capped onsite.
- Wetlands would be created within the floodplain following consolidation of soils. Such work would provide added benefits in terms of replacing wetlands which may have been affected by historical site activities, most of which occurred before adoption of the Federal Clean Water Act Section 404 and corresponding state wetland programs.

The design assumptions and volume calculations presented in the PRP Group's Addendum Feasibility Study Report (March, 1995) are not necessarily consistent with those presented in the HNUS/GF Final Feasibility Study Report (November, 1993). The estimated capital and O&M cost for option 2A based on PRP design assumption is \$5,921,000 and \$55,000, respectively. The present worth cost for this alternative based on a seven percent APR for a period of 30 years is \$6,600,000. A detailed breakdown of the cost estimate is presented in Appendix A.

TASK I

COST ESTIMATE FOR THE PRP GROUP OPTION 3A

Option 3A (presented in Section 4.2.3 of the PRP Group document) would essentially include all of the elements of Option 2A except that soils with lead levels greater than 10,000 ppm and the ball mill tailings and aluminum dross piles would be treated using solidification - stabilization - fixation treatment. The treated material would be integrated into the cap used to cover the untreated soils and materials which exceed the 1,000 to 3,000 ppm lead action level outside the floodplain.

The design assumptions and volume calculations presented in the PRP Group's Addendum Feasibility Study Report (March, 1995) are not necessarily consistent with those presented in the HNUS/GF Final Feasibility Study Report (November, 1993). The estimated capital and O&M cost for Option 3A based on PRP design assumptions is \$23,821,000 and \$55,000 respectively. The present worth cost for this alternative based on a seven percent APR for a period of 30 years is \$24,500,000. A detailed breakdown of the cost estimate is presented in Appendix A.

TASK 2

RECALCULATIONS OF COST ESTIMATE
USING A 200 PPM CLEANUP LEVEL FOR LEAD
IN FLOODPLAIN SOILS FOR PREFERRED ALTERNATIVE 4

The additional volume of soil in the floodplain to be remediated based on a revised cleanup level of 200 ppm of lead is approximately 20,000 cubic yards (cy). This estimate does not include the wooded floodplain areas because soil excavation will not occur in these areas. The addition of 20,000 cy (30,000 tons) to the approximately 675,000 tons of material previously calculated would result in an estimated capital and O&M cost of \$38,384,000 and \$165,000, respectively. The present worth cost for this alternative based on a seven percent APR for a period of 30 years is \$40,400,000. A detailed breakdown of the cost estimate is presented in Appendix B.

TASK 2

RECALCULATION OF COST ESTIMATE
USING A 110 PPM CLEANUP LEVEL FOR LEAD IN
JACK'S CREEK SEDIMENTS FOR PREFERRED ALTERNATIVE 4

Dredging of Jack's Creek was not recommended in the final FS because it was felt that the damage caused by dredging would exceed the benefits to be gained by the removal of the relatively small volume of somewhat contaminated Creek sediments. The ecosystem of Jack's Creek as shown in studies performed during the Remedial Investigation, has largely recovered from impacts which occurred historically, and currently, only the sampling station adjacent to the site near the Ball Mill Tailing Pile (station SED/SW-03) still exhibits deterioration (Gannett Fleming, Inc. 1993).

Gannett Fleming proposed that if dredging is to occur at all, that it be limited to depositional areas between Stations SED/SW-03 and SED/SW-24 slightly exceeds the proposed 110 ppm remediation limit. However, this sampling location is also immediately adjacent to the road which is the mostly likely source of the very low level contamination in this area. Also, the value of 135 ppm lead found in the sediments in this location is well within the +/-30% precision range which is assumed for CLP data of this type, indicating that 135 ppm is not significantly deferent from the proposed remediation limit. Given the risks to stream biota from remediation, and the low likelihood of the lead contamination at Station SED/SW-24 resulting primarily from the Jack's Creek Site-related sources, dredging in this area is not recommended.

The sediment volume calculations from dredging depositional areas in the one mile stretch of Jack's Creek downstream from Station SED/SW-3 to just below SED/SW-06 is estimated at 500 cy (750 tons). The increase in cost for dredging and onsite treatment would result in a estimated capital and O&M cost of \$38,414,000 and \$165,000, respectively. The present worth cost for this alternative based on a seven percent APR for a period of 30 years is \$40,500,000. A detailed breakdown of the cost estimate is presented in Appendix B.

APPENDIX A

AR304136

**COST ESTIMATE FOR PRP OPTION 2A
JACK'S CREEK SITE**

Component	Capital Cost (\$)	O & M Cost (\$)	Cost Backup Page Nos.
Deed Restrictions	1,000	(1)	-
Fence Construction	67,000	(1)	1-2
Disposal of Drums/Vat	35,000	(1)	3-6
Demolition of Buildings	700,000	(1)	7-9
Monitoring of Groundwater/Jack's Creek	48,000	28,000	10-12
Wetlands Mitigation	340,000	17,000	13
Dredging of Sediments from Creek	30,000	(1)	14
Consolidation/Capping	4,700,000	10,000	15-20
TOTAL	5,921,000	55,000	

Notes: (1) No O&M costs are anticipated

**COST ESTIMATE FOR PRP OPTION 3A
JACK'S CREEK SITE**

Component	Capital Cost (\$)	O & M Cost (\$)	Cost Backup Page Nos.
Deed Restrictions	1,000	(1)	-
Fence Construction	67,000	(1)	1-2
Disposal of Drums/Vat	35,000	(1)	3-6
Demolition of Buildings	700,000	(1)	7-9
Monitoring of Groundwater/Jack's Creek	48,000	18,000	10-12
Wetlands Mitigation	340,000	17,000	13
Dredging of Sediments from Creek	30,000	(1)	14
Consolidation/Capping	5,600,000	10,000	21-24
Solidification - Stabilization - Fixation	17,000,000	(1)	25
TOTAL	23,821,000	55,000	

Notes: (1) No O&M costs are anticipated

FENCE CONSTRUCTION

AR304139



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Jack's Creek FS

Fence Construction

BY RFB

DATE 11/20/95

CHKD. BY CY

DATE 11/28/95

SHEET NO. 1 OF 25

JOB NO. 27307.001

Construction of a fence on the northern end of Active
Scrap Yard

Assume 2000 LF

Estimated cost by vendor @ \$ 24/LF	-	\$ 48,000
Procurement of Subcontractor (15%)	-	\$ 7,200
Contingencies & Oversight (25%)	-	<u>\$ 12,000</u>

Total Estimated Cost - \$ 67,200

say \$ 67,000

Note: See following page for back-up from vendor

AR304140

ANCHOR
FENCE,
INC.



6500 Eastern Avenue
Baltimore, Maryland 21224
(301) 633-6500

Telex No.: 87-972 (Anchorpost Bal)
Fax No.: (301) 633-6506

June 9, 1992

VIA FAX TO 410 433 6520

To: T. Williams
GANNETT FLEMING

Budget prices for your project are as follows:

2000 LF ALUMINIZED CHAIN LINK FENCE (9' high),
consisting of

- 2" x 9 ga. x 96" chain link fabric
- 2-1/2" OD line posts, 10' o.c.
- 3" OD terminal posts
- top and bottom tension wire
- & all necessary fittings

TOTAL PRICE FINISHED AND INSTALLED - \$24.00 per LF

Please contact me if you have any questions,

Regards,

Art Mayne
Art Mayne

AM/aw

AR304141

DISPOSAL OF DRUMS/VAT

AR304142

I Empty drums & drums containing soils

- | | | | |
|----|-----------|---|--|
| 1) | Labor | - | \$ 1,200 x 3 days = \$ <u>3,600</u> |
| 2) | Equipment | - | \$ 2,100 x 3 days = \$ 6,300
+\$500 (mob) = \$ <u>6,800</u> |
| 3) | Disposal | - | \$ <u>10,070</u> |

II One Vat containing Cyanide Contaminated Sludge

- | | | | |
|----|-----------|---|---------------|
| 4) | Equipment | - | \$ <u>770</u> |
| 5) | Disposal | - | \$ <u>570</u> |

Transportation	-	\$ <u>700</u>
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		\$ 22,510
Procurement of Subcontractors (30%)	-	\$ 6,753
Contingencies & Oversight (25%)	-	\$ <u>5,627</u>

Total Estimated Cost	-	\$ <u>34,890</u>
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say \$ 35,000

Note: See following pages for back-up from vendors



CLEAN VENTURE, INC.

806-P Barkwood Court
Linthicum, Maryland 21090

RECEIVED

JUN 03 1992

CLEAN VENTURE, INC.
Baltimore, Maryland

Gannett - Fleming
Village of Cross Keys
Suite 200
Baltimore, Maryland 21210

June 4, 1992

Attn: Mr. Rayo Bhungara

Dear Mr. Bhungara,

Clean Venture is pleased to present the following estimate for removal of your bulk waste at the Pennsylvania site.

I Bulk Soil Disposal Project

Labor

1 Supervisor	10 hours @ \$45/hr	\$450.00
1 Equipment operator	10 hours @ \$40/hr	\$400.00
1 Clean - up technician	10 hours @ \$35/hr	\$350.00
Total Estimated Labor Cost		<u>\$1200.00</u> x 3 days

Equipment

1 Dump truck	\$1500.00
Miscellaneous hard tools	\$100.00
Drum tipper	\$500.00
Mobilization	\$500.00
Total Estimated Equipment Cost	<u>\$2600.00</u> x 3 days

Disposal

RCRA Regulated Soil and crushed drums \$265/ton Assume 38 tons

Total cost = \$ 10,070

Treatment:

Landfill

Terms:

-No F,P,U,K Listed Waste
-No D001, D003, D012-D017
-No Debris greater than 2'x2'x2'

II Additional Cyanide Vat Clean-up

(2) Level A gear units @ 200/price	\$400.00
1 High Pressure Washer \$150	\$150.00
5 Dot poly lined drums @ \$55/drum	\$220.00
Total Estimated Project Cost	<u>\$770.00</u>

Disposal

1 Drum cyanide waste 116 pound minimum \$4.90/lb Assume < 116 lb

Treatment:

Incineration

Total Cost = \$ 570.00

Terms: <10 % cyanides
F listed material only.
Drum Transportation \$700.00
one hour free loading
200 mile radius from Elizabeth N.J.

Clean Venture, Inc. (CVI) is a chemical, oil and industrial waste management firm with experience in all aspects of environmental contracting, including site investigations, sampling, analyses, site remediation, transportation and disposal. CVI has the technical expertise, equipment, manpower and facilities required to successfully meet your project needs.

All Clean Venture, Inc. employees working on this project have a minimum of 40 hours training, as mandated by the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120. In addition, personnel are monitored annually in CVI's medical surveillance program.

Clean Venture will supply all personnel, materials, equipment and documentation required to complete this turnkey project.

Clean Venture is aware of and adheres to all federal, state and local laws and ordinances. Clean Venture, in conjunction with Cycle Chem, Inc., form an environmental service group and disposal facility capable of solving and eliminating most situations involving chemical and hazardous wastes.

Prior to disposal, a Material Profile Sheet (MPS) must be completed and signed by the generator. The material profile sheet must be approved by Cycle Chem, Inc. prior to pickup of any wastes. An EPA ID number is also required prior to waste pick up. A firm price will be quoted from the information supplied to the MPS.

All transportation will be performed by fully licensed and insured hazardous waste transport vehicles. Transportation will be performed in compliance with DOT regulations 49 CFR Parts 100-177 concerning proper labeling and placarding, and with EPA regulations 40 CFR Part 262 concerning shipping manifests.

The price listed is firm for thirty days. All billing will be on a net 30 day basis unless specified otherwise. Our on-site personnel will complete a daily worksheet which will note specific quantities and units of manpower, equipment, materials, supplies, freight and disposal on a per day basis. This work sheet is then submitted to you for verification. From the daily worksheet, a fair and accurate billing is prepared.

Payment terms will be Net 30 days after presentation of invoices, pending credit approvals, and Customer agrees to pay such invoices in full when due, whether or not Customer has been paid by any insurance carrier or other party against whom it may have a

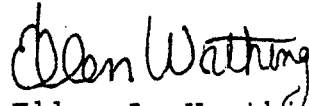
AR304145

claim. Clean Venture, Inc. reserves the right to review your credit status and change terms at any time during the course of this project. Interest will accrue on all amounts unpaid after the expiration of thirty days from the invoice due date at the rate of 1.5% a month, which is an annual percentage rate of 18%, until paid and Customer agrees to pay interest on all expenses of collection, including a reasonable attorney's fee in an amount of 20% of our billing.

Clean Venture, Inc. appreciates the opportunity to present this proposal. We sincerely look forward to performing this project. Should you require any further information or have any questions, please do not hesitate to call.

Very truly yours,

CLEAN VENTURE, INC.



Ellen A. Worthing
Sales Representative

EAW:wen

AR304146

**DEMOLITION / DECONTAMINATION / SECURING
OF BUILDINGS**

AR304147

Belt Mill Building

$$11,500 \text{ SF} \times 25 \text{ feet high} = 287,500 \text{ CF}$$

$$287,500 \text{ CF} \times \$0.21 = \$60,375$$

(Means, 1995)

$$\text{say } \$ \underline{\underline{60,000}}$$

Aluminum Dross Buildings

$$5850 \text{ SF} \times 25 \text{ feet high} = 146,250 \text{ CF}$$

$$146,250 \text{ CF} \times \$0.21 = \$30,712$$

(Means, 1995)

$$\text{say } \$ \underline{\underline{30,000}}$$

Wasco Incinerator

$$11,300 \text{ SF} \times 25 \text{ feet high} = 282,500 \text{ CF}$$

$$2 \text{ concrete block sheds } 500 \text{ SF} \times 2 \text{ feet high} = 1,000 \text{ CF}$$

$$282,500 \text{ CF} \times \$0.21 = \$59,325$$

$$1,000 \text{ CF} \times \$4.77 = \$4,770$$

(Means, 1995)

$$= \$64,095$$

$$\text{say } \$ \underline{\underline{64,000}}$$

Battery Breaking Sheds

$$1,200 \text{ SF} \times 25 \text{ feet high} = 30,000 \text{ CF}$$

$$30,000 \text{ CF} \times \$0.21 = \$6,300$$

(Means, 1995)

Precious Metals Building

$$36,000 \text{ SF} \times 15 \text{ feet high} = 537,500 \text{ CF}$$

$$537,500 \times \$0.21 = \$112,875$$

(means, 1995)

say \$113,000

Smaller Building

$$84,000 \text{ SF} \times 15 \text{ feet high} = 1,265,000 \text{ CF}$$

$$1,265,000 \text{ CF} \times \$0.21 = \$265,650$$

(means, 1995)

say \$266,000

Miscellaneous Buildings (Warehouse, Scale Bldg)

$$240,000 \text{ CF} \times \$0.21 = \$50,400$$

(means)

say \$50,000

Disposal of Contaminated Wood

Assume 2 persons \times 16 hours to dismantle and stack

$$2 \text{ p} \times 8 \text{ h} \times \$40/\text{hour} = \$1,120$$

$$\text{Contaminated Wood} = 4 \text{ cubic yard} \times \$300/\text{cy} = \$1,200$$

$$\text{TOTAL} = \$2,320$$

say \$3,000



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Jacks Creek FS
Building Demolition
BY RRB DATE 11/21/95 CHKD. BY CY DATE 11/28/95

SHEET NO. 9 OF 25
JOB NO. _____

TOTAL COST FOR DEMOLITION/DISPOSAL = \$ 592,300

Procurement of Subcontractor (0.5%) = \$ 29,615

Contingencies & oversight (1%) = \$ 59,230

= \$ 681,145

say \$ 700,000

AR304150

GROUNDWATER / JACK'S CREEK MONITORING

AR304151

Annual GW Monitoring

10 deep wells to be purged and sampled over a
 3 day period by 2 people and analyzed for
 TAL metals and cyanide

	<u>Level of Effort</u>				
Mob/Demob:	10 hours	x	\$ 45/hour	=	\$ 450
Sampling:	2 people x 3 days x 10 hours/day	x	\$ 45/hour	=	\$ 2,700

Data Validation: 15 samples (including QC) x 1 hour/sample x \$ 45/hour = \$ 675

Data Tabulation: 15 samples x 1 hour/sample x \$ 45/hour = \$ 675

Report Preparation: 40 hours x \$ 45/hour = \$ 1,800

Other Direct Costs

Transportation, Living, Meals, Shipping,
 Photocopying, Materials & Supplies = \$ 2,000

Laboratory Costs

15 samples x \$ 450 / sample (TAL Metals & Cyanide) = \$ 6,750

collection & Handling Purge Water = \$ 10,000

TOTAL

say

= \$ 28,425
\$ 28,000

AR304152

One-Time Surface Water / sediment / Fish Monitoring

3 locations along Jack's Creek to be sampled for surface water, sediment, and fish by 2 people over 2 days and analyzed for TCL Organics, TAL Metals, and Cyanide.

Level of Effort

Mob / Demob:	20 hours x \$45/hour	=	<u>\$ 900</u>
Sampling :	2 people x 2 days x $\frac{10 \text{ hours}}{\text{day}}$ x \$45/hour	=	<u>\$ 1,800</u>
Data Validation :	13 samples (including QC) for organics @ 2 hours/sample x \$45/hour	=	<u>\$ 1,170</u>
	13 samples for inorganics @ 1 hour/sample x \$45/hour	=	<u>\$ 585</u>
Data Tabulation:	26 samples x 1 hour/sample x \$45/hour	=	<u>\$ 1,170</u>
Report Preparation:	40 hours x \$45/hour	=	<u>\$ 1,800</u>

Other Direct Costs

Transportation, Living, Meals, Shipping,
 Photocopying, Materials & Supplies = \$ 2,000

AR304153



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Jack's Creek FS
SW/Sed/Fish Monitoring
BY RRB DATE 11/21/95 CHKD. BY CY DATE 11/28/95

SHEET NO. 12 OF 25

JOB NO. _____

Laboratory Costs

10 Samples for TCL Organics @ \$1,250/sample = \$ 12,500

10 Samples for TAL Metals/Cyanide @ \$450/sample = \$ 4,500

3 Fish Samples for TCL Organics (\$2,000/sample) and
TAL Metals/Cyanide (\$1,200/sample) = \$ 9,600

TOTAL = \$ 38,230

say \$ 38,000

Posting Fishing Advisories

— \$ 10,000

AR304154

WETLANDS MITIGATION

AR304155

I. Wetland Construction (estimate 5 acres)

1) Earthwork: \$10/cy

$$4840 \text{ square yard/acre} \times 1 \text{ yard deep} \times 5 \text{ acres} \times \$10/\text{cy} = \underline{\$242,000}$$

2) Plant Material: Trees - \$12 (12-15' apart)
Shrubs - \$10 (4-8' apart)
Herbs - \$1 (1-2' apart)

$$5 \text{ acres} \times 100 \text{ trees/acre} \times \$12/\text{tree} = \$6,000$$

$$5 \text{ acres} \times 300 \text{ shrubs/acre} \times \$10/\text{shrub} = \$15,000$$

$$5 \text{ acres} \times 1000 \text{ herbs/acre} \times \$1/\text{herb} = \underline{\$5,000}$$

3) Plant Placement: 2 times plant material cost = \$52,000II. Design of wetland (1-10 acre size) = \$20,000III. Total cost = \$340,000IV. O & M cost (say 5% of capital cost) = \$17,000

DREDGING OF JACK'S CREEK SEDIMENTS

AR304157



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Jack's Creek FS

Dredging of sediments

BY RRB DATE 11/22/95 CHKD. BY cy DATE 11/28/95

SHEET NO. 14 OF 25

JOB NO. _____

Dredging of Jack's Creek Sediments

Based on HNUS / GF volume estimate = 500 cy or 750 tons

$$750 \text{ tons} \times \$ 25/\text{ton} = \$ 18,750$$

(vendor estimate)

$$\begin{aligned} \text{Procurement of Subcontractor (1\%)} &= \$ 1,875 \\ \text{Contingencies \& Oversight (5\%)} &= \$ 9,375 \\ &= \underline{\underline{\$ 30,000}} \end{aligned}$$

The dredged sediments would be placed onsite
under a cap.

AR304158

CONSOLIDATION/CAPPING
(OPTION 2A)

AR304159

Alternative 2A

Item: Consolidate Action Level Soils

Quantity: 66,000 cu. yd. from waste piles (Grading)

100,000 cu. yd. from outside area to be capped. (excav.)
38.2 ac → 2' thick,

Break out as separate items

1. Flatten waste piles - 66,000 cu. yd.

2. Consolidate action level soils - 100,000 cu. yd.

Unit Cost:

For 1. Flatten waste piles

Assume 200 HP. Doter, 150' movement.

\$ = 2.32 / cu. yd. Means 1994

For 2. Consolidate Action Level soils

Haul distance will average 1200 feet.
Assume 14 cu. yd self-propelled scraper

\$ 3.18 / cu. yd. Means 1994

Alternative 2A

Item: Construct Geomembrane Cap.

Quantity: 36 acres

Components:

1. 40 mil HDPE liner - 36 AC = 1,568,200 SQFT
2. 6" Sand drainage layer = 29,000 CU.YD
3. 12" protective soil layer = 58,000 CU.YD
4. 6" topsoil = 29,000 CU.YD.
5. drainage collection system
 - a. 8-inch perforated PVC - 5000 L.F.
 - b. 12-inch solid PVC lateral 3000 L.F.
 - c. 18" sq. gravel box - 5000 L.F. = 420 CU.YD
 - d. Geotextile filter cloth 35000 SQFT = 3900 SQ.YD.
6. Seed & mulch - 70.2 acres = 3,060 M.S.F.
7. Stormwater / sediment basin
 - a. excavated basin 36 AC x 3600 CU.FT/AC = 4800 CU.YD
 - b. diversion ditch Assume 3000 L.F. x 4' wide = 1300 S.F.
 - c. User & barrier outlet device = 120 L.F.
 (24" RCP - 120 L.F.)

Unit Cost: See Separate sheets
 Unit cost same for Alternatives 2A and 3A

AR304161

Unit Cost:

1. 40 mil HDPE Liner

Compare cost: 50 mil PVC = \$0.40/S.F. Cecil Co. Md.
 Northern Landfill

40 mil polyethylene vapor barrier
 = \$11.35 / sq. = \$0.1135 / S.F.

polyethylene pool cover = \$0.32 / S.F.

Use \$0.25 / SQ.FT.

2. 6-inch Sand drainage layer.

Means → w/ 10 mile haul = \$22.50 / C.Y.

3. 12-inch protective soil layer - Use common fill (10 mi source)

a. common fill borrow, 5 C.Y. bucket, \$4.72 / C.Y.

b. compaction, vibrating roller 6" lift \$0.47 / C.Y.

c. Haul - 10 mi round trip, 20 C.Y. hauler \$6.10 / C.Y.

\$11.29 / C.Y.



4. 6-inch topsoil - 10 mile round trip

- a. topsoil - 5 c.y. bucket
- b. Haul - 10 miles - 20 c.y. Hauler

\$ 16.55/c.y.
\$ 6.10/c.y.
\$ 22.65/c.y.

5. Drainage Collection System

- a. 8-inch perforated PVC \$ 6.05/L.F. 027 168
- b. 12-inch PVC \$ 11.55/L.F. "
- c. Gravel (Round, 3/4") \$ 20.00 /c.y. 027 054
- d. Geotextile \$ 1.48 /s.y. 027 054

6. Seed & Mulch
Tractor spreader

\$ 17.95/MSF

7. Stormwater / Sediment Basin

- a. Excavation \$ 1.61/c.y.
- b. Ditch (fine grade) \$ 0.72/s.y.
- c. Paver & Base \$ 26.00/L.F.

Alternative 2A

Description	UNIT	QUANTITY	UNIT COST	TOTAL COST
1. Flatten waste piles	C.Y.	66,000	2.32	153,120.00
2. Consolidate Action Level soils	C.Y.	160,000	3.18	508,800.00
3. Remove and Dispose Existing RE Liner	L.S.			7,500.00
4. Regrade Site	Acres	58.2	5,000	291,000.00
5. Install 2" Crushed Limestone Layer	C.Y.	15,500	24.00	372,000.00
6. 40 mil HDPE Liner	S.F.	1,568,200	0.25	392,050.00
7. 6-inch sand drainage layer	C.Y.	29,000	22.50	652,500.00
8. 12-inch protective soil layer	C.Y.	58,000	11.29	654,820.00
9. 6-inch topsoil	C.Y.	29,000	22.45	650,850.00
10. Drainage Collection System				
a. 8-inch pref. PVC Drain	L.F.	5,000	6.05	30,250.00
b. 12-inch PVC Drain	L.F.	3,000	11.55	34,650.00
c. Gravel	C.Y.	420	20.00	8,400.00
d. Geotextile	S.Y.	3,900	1.48	5,772.00
11. Seed - tractor	M.S.F.	3,060	17.95	54,927.00
12. Stormwater / Sediment Basin				
a. Excavation	C.Y.	4800	1.61	7,728.00
b. diversion ditch	S.Y.	1300	0.72	936.00
c. Buser & barrel	L.F.	120	26.00	3,120.00

AR304164



Alternative 2A Cont.

13. Soil Sampling	EA.	1650	150	47,500.00
14. Abandoned Sample Wells	L.F.	338	28	9,240.00
15. Landfill >50 ppm waste	Ton	50	350	17,500.00
16. Remove Sediment from 140 Creek	L.S.			20,000.00
17 Mobilization				10,000.00
TOTAL				3,968,000.00

say 4,000,000

Procurement of Subcontractor (0.1%) 40,000
Contingencies & oversight (15%) 600,000
4,640,000

say \$ 4,700,000

Annual O & M for Cap Maintenance = \$ 10,000

**CONSOLIDATION/CAPPING
(OPTION 3A)**

AR304166

Alternative 3A

Item: Consolidate Untreated Action Level Soils

Quantity: 122000 cu. yds.

Unit Cost: \$3.18 C.Y.

Item: Geomembrane Cap

Quantity: 22 ACRES

Components:

1. Solidified / Stabilized / fixed soil layer = 250,000 C.Y.
2. 6-inch sand layer = 18,000 CY
3. Impervious soil layer
 Clay or bentonite 1" thick 36,000 C.Y.
4. 12-inch protective soil layer = 36,000 C.Y.
5. 6-inch top soil = 18,000 CY.
6. Drainage Collection System
 - a. 8" perforated PVC = 4000 L.F.
 - b. 12" solid PVC = 3000 L.F.
 - c. 18" stone box = 350 C.Y.
 - d. geotextile = 28000 SF = 3100 SY
7. Seed & mulch = 70.2 AC
8. Stormwater / Sediment - Same as Alternative 2A



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Lack's Creek FS
Consolidation / Capping
BY clb DATE 11/22/95 CHKD. BY RRB DATE 11/27/95

SHEET NO. 22 OF 25
JOB NO. _____

Unit Cost:

For items 2, 4-8, use unit cost from alternative 2A

3. Impermeable soil layer.

- | | |
|---|----------------------|
| a. Clay borrow - wheelman, 5 c.y bucket | \$ 4.75/c.y. |
| b. compaction 4 passes | \$ 1.15/c.y. |
| c. Haul - 10 mile round trip | \$ 6.10/c.y. |
| | <u>\$ 12.00/c.y.</u> |

1. Solidified / Stabilized / Fixed soil layer.

- | | |
|---|--------------|
| a. excavate / borrow 1/4 mile haul (4 passes) | \$ 7.99/c.y. |
|---|--------------|

AR304168

Alternative 3A

Description	UNIT	QUANTITY	UNIT COST	TOTAL COST
1. Mobilization	L.S.			10,000.00
2. Consolidate Undisturbed Action Level Soils	C.Y.	122,000	3.18	387,960.00
3. Solidified / Stabilized / Fixed Soil Layer	C.Y.	250,000	7.99	1,997,500.00
4. Remove & Dispose Ex. Layer	L.S.			7,500.00
5. Regrade Site	Acres	58.2	5,000	291,000.00
6. Install 2" Crushed Limestone Layer	C.Y.	6,000	24.00	144,000.00
7. 6-inch sand drainage Layer	C.Y.	18,000	22.50	405,000.00
8. Impervious soil layer	C.Y.	30,000	12.00	432,000.00
9. 12-inch protective soil layer	C.Y.	36,000	11.29	406,440.00
10. 6-inch topsoil	C.Y.	18,000	22.65	407,700.00
11. Drainage Collection System				
a. 8" perf. pipe PVC	L.F.	4,000	6.05	24,200.00
b. 12" PVC chain	L.F.	3,000	11.55	34,650.00
c. Gramp	C.Y.	350	20.00	7,000.00
d. Geotextile	S.Y.	3,100	1.48	4,588.00
12. Seed - Tractor	MSF.	3060	17.95	54,827.00
13. Stormwater / sediment				
a. Excavate	C.Y.	4800	1.61	7,728.00
b. diversion ditch	S.Y.	1300	0.72	936.00
c. Eiser & Barrel	L.F.	120	26.00	3,120.00

AR304169



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Wick's Creek FS

Consolidation / Capping

BY dlb

DATE 11/22/95

CHKD. BY RRB

DATE 11/27/95

SHEET NO. 24 OF 25

JOB NO. _____

14. Soil Sampling	EA	650	150.00	97,500.00
15. Abandon Sample wells	L.F.	330	28.00	9,240.00
16. Landfill <50 ppm waste	Ton	50	350	17,500.00
17. Remove Sediment from Creek	L.S.			20,000.00
TOTAL				4,750,480.00

say 4,800,000

Procurement of Subcontractor (0.1%) 48,000

Contingencies & Oversight (15%) 720,000

5,568,000

say \$ 5,600,000

Annual O & M for Cap Maintenance

= \$ 10,000

AR304170

**SOLIDIFICATION - STABILIZATION - FIXATION
TREATMENT**

AR304171

Solidification - Stabilization - Fixation. (soils > 10,000 ppm of

Volume of material to be treated based on the

PRP Group estimate is 164,000 cubic yards (cy)

Assume 1.5 tons/cy = 246,000 tons

Vendor estimate = \$ 60 / ton
(Soil Safe)

Total Cost for Treatment	=	\$ 14,760
Pilot Study	=	\$ 100,
Bench Study	=	\$ 10
		<u>14,870</u>

procurement of Contractor (0.05%)	=	\$ 74,
Contingencies & oversight (10%)	=	\$ <u>1,487</u>
	=	\$ 16,431

say \$ 17,000,00

APPENDIX B

AR304173

**COST ESTIMATE SUMMARY FOR ALTERNATIVE 4
JACK'S CREEK SITE**

COST ESTIMATE PRESENTED IN THE NOVEMBER, 1993 FINAL FS REPORT

Component	Capital Cost (\$)	O&M Cost (\$)	Cost Backup Page Nos.
Limited actions (1)	2,435,000	165,000	1-22
Chemical Fixation (2)	34,000,000	(3)	29
TOTAL	36,435,000	165,000	

RECALCULATION FOR A 200 PPM LEAD CLEANUP LEVEL FOR FLOODPLAIN SOILS

Component	Capital Cost (\$)	O&M Cost (\$)	Cost Backup Page Nos.
Limited actions (1)	2,384,000	165,000	1-22
Chemical Fixation (2)	36,000,000	(3)	23
TOTAL	38,384,000	165,000	

- Notes: (1) The cost breakdown for limited actions is the same as that presented in the November, 1993 Final except for Disposal of Drums/Vat where a calculation error resulted in an incorrect estimate.
- (2) Soils across the site (scrap yard, fenced area) and waste piles will be treated using a chemical fixation technology. The economic impact of not having the scrap yard operating at its full potential during remediation activities has not been considered.
- (3) No O&M costs are anticipated.

**COST ESTIMATE SUMMARY FOR ALTERNATIVE 4
JACK'S CREEK SITE**

COST ESTIMATE PRESENTED IN THE NOVEMBER, 1993 FINAL FS REPORT

Component	Capital Cost (\$)	O&M Cost (\$)	Cost Backup Page Nos.
Limited actions (1)	2,435,000	165,000	1-22
Chemical Fixation (2)	34,000,000	(3)	29
TOTAL	36,435,000	165,000	

**RECALCULATION FOR A 110 PPM LEAD CLEANUP LEVEL
FOR JACK'S CREEK SEDIMENT**

Component	Capital Cost (\$)	O&M Cost (\$)	Cost Backup Page Nos.
Limited actions (1)	2,384,000	165,000	1-22
Chemical Fixation (2)	36,000,000	(3)	29
Dredging	30,000	(3)	25
TOTAL	38,414,000	165,000	

- Notes: (1) The cost breakdown for limited actions is the same as that presented in the November, 1993 FS Report except for Disposed of Drums/Vat where a calculation errors resulted in an incorrect estimate.
- (2) Soils across the site (scrap yard, fenced areas), waste piles, and dredged sediments will be treated using a chemical fixation technology. The economic impact of not having the scrap yard operating at its full potential during remediation activities has not been considered.
- (3) No O&M costs are anticipated.

FENCE CONSTRUCTION

AR304176



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Jack's Creek FS
Fence Construction

SHEET NO. 1 OF 25

JOB NO. 27307.001

BY RRB DATE 6/22 CHKD. BY RH DATE 7/8/92

Construction of a fence on the northern end of Activ.
Scrap Yard

Assume 2000 LF

Estimated cost by vendor @ \$ 24/LF	-	\$ 48,000
Procurement of Subcontractor (15%)	-	\$ 7,200
Contingencies & Oversight (25%)	-	\$ 12,000

Total Estimated Cost - \$ 67,200

say \$ 67,000

Note: See following page for back-up from vendor

AR304177

ANCHOR FENCE, INC.



6500 Eastern Avenue
Baltimore, Maryland 21224
(301) 633-6500

Telex No.: 87-972 (Anchorpost Bal)
Fax No.: (301) 633-6506

June 9, 1992

VIA FAX TO 410 433 6520

To: T. Williams
GANNETT FLEMING

Budget prices for your project are as follows:

2000 LF ALUMINIZED CHAIN LINK FENCE (9' high),
consisting of

- 2" x 9 ga. x 96" chain link fabric
- 2-1/2" OD line posts, 10' o.c.
- 3" OD terminal posts
- top and bottom tension wire
- & all necessary fittings

TOTAL PRICE FINISHED AND INSTALLED - \$24.00 per LF

Please contact me if you have any questions,

Regards,

Art Mayne
Art Mayne

AM/aw

AR304178

RESOURCE RECOVERY OF BATTERY CASINGS

AR304179

Resource Recovery of Battery Casings at a
Facility in Pennsylvania

Estimated quantity of crushed battery casings
after separation from the soils - 10,000 cy x 50% reduction
- 5,000 cy (on crushing)

Estimated Cost from vendor in Reading, PA -
Exide Corporation (contact: Ken Elliott (215) 378-0874)

\$ 150/cy

For 5,000 cy, estimated cost - \$ 750,000

Procurement of Subcontractor (5%)	-	\$ 37,500
Contingencies & Oversight (3%)	-	\$ 22,500
Total Estimated Cost	-	<u>\$ 810,000</u>

Note: The costs for segregation/crushing/transportation
of casings have been shown on the following pages

AR304180



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Jack's Creek FS
Segregating / Crushing / Transporting
BY RRB DATE 6/23 CHKD. BY RH DATE 7/8/92

SHEET NO. 4 OF 25
JOB NO. 27307.001

Segregating, crushing, and transporting of
Battery casings to a Resource Recovery facility
in Pennsylvania

Estimated quantity of battery casings mixed
in with soils — 18,500 cy
Estimated quantity of battery casings after removal
from soils — 10,000 cy
Estimated quantity of crushed casings to be transported — 5,000 cy
Estimated cost from vendor or 7,500 ton
Entact (Contact: Larry Farnsworth (800) 788-8897)

For segregating, crushing, and transportation
of battery casings (see next page) — \$ 525,000

Procurement of Subcontractors (5%) — \$ 26,250
Contingencies & oversight (20%) — \$ 105,000
Estimated Total Cost — \$ 656,250
say — \$ 656,000

Note: See following page for vendor back-up

AR304181

ENTACT

environmental tactics in waste management

June 27, 1992

Rayo Bhungara
Gannett Fleming
Village of Cross Keys
Suite 200
Baltimore, MD 21210

Dear Mr. Bhungara,

ENTACT Inc. is pleased to provide you this informal pricing information for battery crushing and transportation. The pricing and volume are estimates based on the data provide in your phone communication dated June 22, 1992, any change in the data could impact these prices. The preliminary information indicates this portion of your project could be in the area of \$ ~~725,000.00~~.
525,000

The equipment necessary to crush the batteries and control the liquids and acid will cost approximately \$ 125,000.00. This will process approximately 200 tons a day.

Labor, Equipment, and Material should cost \$ 50,000 per month for approximately three months. The actual cost could vary as much as (plus or minus) 10 percent based on actual field conditions and volumes.

Need to
transport
7,500
tons of
material

400 200,000
Transportation should cost approximately \$ ~~400,000.00~~. This price based on ~~800~~ loads of 20 tons per load. Acid neutralization, transportation and disposal should cost approximately \$ 50,000.00.

I would be glad to provide a detailed scope of work for this project for a consulting fee of \$ 5,500.00. If you should have any additional questions please call our office at (214) 580 1323 and ask for Larry Farnsworth or Michael Studer.

Sincerely,

Larry Farnsworth
Larry Farnsworth
Project Manager

AR304182

DISPOSAL OF DRUMS/VAT

AR304183



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT Jack's Creek FS
Drums & VAT disposal
BY RRB DATE 11/20/95 CHKD. BY LY DATE 11/28/95

SHEET NO. 6 OF 25
JOB NO. 27307-001

I Empty drums & drums containing soils

- | | | | |
|----|-----------|---|---|
| 1) | Labor | - | \$ 1,200 x 3 days = \$ 3,600 |
| 2) | Equipment | - | \$ 2,100 x 3 days = \$ 6,300
+ \$ 500 (mob) = \$ 6,800 |
| 3) | Disposal | - | \$ 31,800 |

II One Vat containing Cyanide Contaminated Sludge

- | | | | |
|----|-----------|---|--------|
| 4) | Equipment | - | \$ 770 |
| 5) | Disposal | - | \$ 570 |

Transportation - \$ 700

		\$ 44,240
Procurement of Subcontractors (30%)	-	\$ 13,272
Contingencies & Oversight (25%)	-	\$ 11,060

Total Estimated Cost - \$ 68,572

Say \$ 68,000

Note: See following pages for back-up from vendor

AR304184



CLEAN VENTURE, INC.

806-P Barkwood Court
Linthicum, Maryland 21090

RECEIVED

JUN 03 1992

CLARK & KLINE
BALTIMORE

Gannett - Fleming
Village of Cross Keys
Suite 200
Baltimore, Maryland 21210

June 4, 1992

Attn: Mr. Rayo Bhumgara

Dear Mr. Bhumgara,

Clean Venture is pleased to present the following estimate for removal of your bulk waste at the Pennsylvania site.

I Bulk Soil Disposal Project

Labor

1 Supervisor	10 hours @ \$45/hr	\$450.00
1 Equipment operator	10 hours @ \$40/hr	\$400.00
1 Clean - up technician	10 hours @ \$35/hr	\$350.00
Total Estimated Labor Cost		<u>\$1200.00</u> x 3 days

Equipment

1 Dump truck	\$1500.00
Miscellaneous hard tools	\$100.00
Drum tipper	\$500.00
Mobilization	\$500.00
Total Estimated Equipment Cost	<u>\$2600.00</u> x 3 days

Disposal

RCRA Regulated Soil and crushed drums \$265/ton Assume 80 cy or 120 tons
 Total cost = \$ 10,070

Treatment: Landfill

Terms:

-No F,P,U,K Listed Waste
 -No D001, D003, D012-D017
 -No Debris greater than 2'x2'x2'

II Additional Cyanide Vat Clean-up

(2) Level A gear units @ 200/price	\$400.00
1 High Pressure Washer \$150	\$150.00
5 Dot poly lined drums @ \$55/drum	\$220.00
Total Estimated Project Cost	<u>\$770.00</u>

Disposal

1 Drum cyanide waste 116 pound minimum \$4.90/lb Assume < 116 lb
 Treatment: Incineration
 Total Cost = \$ 570.00

AR304185

Terms: <10 % cyanides
F listed material only.
Drum Transportation \$700.00
one hour free loading
200 mile radius from Elizabeth N.J.

Clean Venture, Inc. (CVI) is a chemical, oil and industrial waste management firm with experience in all aspects of environmental contracting, including site investigations, sampling, analyses, site remediation, transportation and disposal. CVI has the technical expertise, equipment, manpower and facilities required to successfully meet your project needs.

All Clean Venture, Inc. employees working on this project have a minimum of 40 hours training, as mandated by the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120. In addition, personnel are monitored annually in CVI's medical surveillance program.

Clean Venture will supply all personnel, materials, equipment and documentation required to complete this turnkey project.

Clean Venture is aware of and adheres to all federal, state and local laws and ordinances. Clean Venture, in conjunction with Cycle Chem, Inc., form an environmental service group and disposal facility capable of solving and eliminating most situations involving chemical and hazardous wastes.

Prior to disposal, a Material Profile Sheet (MPS) must be completed and signed by the generator. The material profile sheet must be approved by Cycle Chem, Inc. prior to pickup of any wastes. An EPA ID number is also required prior to waste pick up. A firm price will be quoted from the information supplied to the MPS.

All transportation will be performed by fully licensed and insured hazardous waste transport vehicles. Transportation will be performed in compliance with DOT regulations 49 CFR Parts 100-177 concerning proper labeling and placarding, and with EPA regulations 40 CFR Part 262 concerning shipping manifests.

The price listed is firm for thirty days. All billing will be on a net 30 day basis unless specified otherwise. Our on-site personnel will complete a daily worksheet which will note specific quantities and units of manpower, equipment, materials, supplies, freight and disposal on a per day basis. This work sheet is then submitted to you for verification. From the daily worksheet, a fair and accurate billing is prepared.

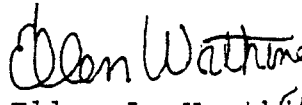
Payment terms will be Net 30 days after presentation of invoices, pending credit approvals, and Customer agrees to pay such invoices in full when due, whether or not Customer has been paid by any insurance carrier or other party against whom it may have a

claim. Clean Venture, Inc. reserves the right to review your credit status and change terms at any time during the course of this project. Interest will accrue on all amounts unpaid after the expiration of thirty days from the invoice due date at the rate of 1.5% a month, which is an annual percentage rate of 18%, until paid and Customer agrees to pay interest on all expenses of collection, including a reasonable attorney's fee in an amount of 20% of our billing.

Clean Venture, Inc. appreciates the opportunity to present this proposal. We sincerely look forward to performing this project. Should you require any further information or have any questions, please do not hesitate to call.

Very truly yours,

CLEAN VENTURE, INC.



Ellen A. Worthing
Sales Representative

EAW:wen

AR304187

WETLANDS MITIGATION

AR304188



I. Wetland Construction (estimate 5 acres)

1) Earthwork: \$10/cy

$$4840 \text{ square yard./acre} \times 1 \text{ yd deep} \times 5 \text{ acres} \times \$10/\text{cy} = \underline{\$242,000}$$

2) Plant Material: Trees - \$12 (12-15' apart)
Shrubs - \$10 (4-8' apart)
Herbs - \$1 (1-2' apart)

$$\begin{aligned} 5 \text{ acres} \times 100 \text{ trees/acre} \times \$12/\text{tree} &= \$6,000 \\ 5 \text{ acres} \times 300 \text{ shrubs/acre} \times \$10/\text{shrub} &= \$15,000 \\ 5 \text{ acres} \times 1000 \text{ herbs/acre} \times \$1/\text{herb} &= \$5,000 \end{aligned}$$

3) Plant Placement: 2 times plant material cost = \$52,000

II. Design of wetland (1-10 acre size) = \$20,000

III. Total cost = \$340,000

IV. O & M Cost (say 5% of capital cost) = \$17,000

**DEMOLITION / DECONTAMINATION / SECURING
OF BUILDINGS**

AR304190

Demolition of Nonhazardous Buildings (including disposal)

Ball Mill Building

11,500 SF concrete slab
20 to 30 feet high
Block walls steel roof
Several large rooms

> Say $11,500 \times 25 = 287,500 \text{ CF}$

$287,500 \text{ CF} \times \$0.19 = \$54,625$
 $\boxed{\$55,000}$

Reference: Means, 1993 -- Building demolition, large urban projects, incl. disposal, steel (see page 18)

Aluminum Dross Buildings

2,500 SF concrete slab, steel beams, sheet metal
1,700 SF concrete slab, steel beams, sheet metal
1,650 SF concrete slab, steel beams, sheet metal

> Say $5850 \times 25 = 146,250 \text{ CF}$

$146,250 \text{ CF} \times \$0.19 = \$27,787$ $\boxed{\$28,000}$

Reference: Means, 1993 (see page 18)

Nasco Incinerator

Concrete slab: $11,300 \text{ square feet} \times 25 \text{ feet} = 282,500 \text{ cubic feet (cf)}$
 2 Concrete block sheds: $500 \text{ square feet} \times 2 \text{ feet} = 1,000 \text{ cubic feet (cf)}$

$282,500 \text{ cf} \times \$0.19 = \$53,675$

$1,000 \text{ cf} \times \$0.21 = \$210$

Ref: Means, 1993

$\boxed{\$55,000}$

Bathtub Breaking sheds

9,500 SF concrete slab

1,200 SF steel beam, sheet metal building

$1200 \text{ SF} \times 25 \times \$0.19 = \$5,700$

Ref: Means, 1993

(see page 19)

$9,500 \text{ SF} \times \$4.49 = \$42,655$

Ref: Means, 1993 (see page 19)

Footings and Foundations Demolition

6" thick @ rods

$\boxed{\$48,000}$

AR304191



Demolition of Hazardous Buildings (including disposal)

Ball Mill Building, wooden steps --- TCLP (Lead) exceeded
Aluminum Dress Buildings, wooden shed --- TCLP (Lead) exceeded
Battery Breaking Sheds, plywood room --- TCLP (Lead) exceeded

Assume

- 3 structures
- 8'x8'x8' wood
- 2 men x 8 hrs to dismantle and stack
@ \$35/hour = \$1,120
- Total wood volume is 100 CF = 3.7 CY
- Disposal cost = \$300 x 4 CY = \$1,200

$$> \$1,120 + \$1,200 = \$2,320$$

Say \$3,000 total or \$1,000 per structure

TOTAL

-	\$ 55,000
-	\$ 28,000
-	\$ 55,000
-	\$ 48,000
-	\$ 3,000
	<u>\$ 189,000</u>

Procurement of Subcontractor (15%)	-	\$ 28,350
Contingencies & Oversight (25%)	-	\$ 47,250
		<u>\$ 264,600</u>

Say \$ 265,000

Note: Decontamination of demolition debris has been estimated at \$30,000 assuming it will be done by the same

AR304192

020 | Subsurface Investigation and Demolition

13 of 25

020 550 Site Demolition		CREW	DAILY OUTPUT	MAN-HOURS	UNIT	1993 BARE COSTS				TOTAL INCL O&P
						MAT.	LABOR	EQUIP.	TOTAL	
554	5600 To 5 miles, add	B-34D	76	.105	C.Y.		2.05	6.35	8.40	10.10
020 600 Building Demolition										
604	0010 BUILDING DEMOLITION Large urban projects, incl. disposal, steel	B-8	21,500	.003	C.F.		.06	.10	.16	*.19
	0050 Concrete	↓	15,300	.004	↓		.09	.13	.22	*.28
	0080 Masonry	↓	20,100	.003	↓		.07	.10	.17	*.21
	0100 Mixture of types, average	↓	20,100	.003	↓		.07	.10	.17	.21
	0500 Small bldgs, or single bldgs, no salvage included, steel	B-3	14,800	.003	↓		.07	.10	.17	.21
	0600 Concrete	↓	11,300	.004	↓		.09	.14	.23	.28
	0650 Masonry	↓	14,800	.003	↓		.07	.10	.17	.21
	0700 Wood	↓	14,800	.003	↓		.07	.10	.17	.21
	1000 Single family, one story house, wood, minimum				Ea.					2,000
	1020 Maximum				↓					3,400
	1200 Two family, two story house, wood, minimum				↓					2,275
	1220 Maximum				↓					5,100
	1300 Three family, three story house, wood, minimum				↓					3,300
	1320 Maximum				↓					6,500
1400 Gutting building, see division 020-716										
608	0010 DISPOSAL ONLY Urban buildings with salvage value allowed									
	0020 Including loading and 5 mile haul to dump									
	0200 Steel frame	B-3	430	.112	C.Y.		2.24	3.58	5.82	7.40
	0300 Concrete frame	↓	365	.132	↓		2.64	4.22	6.86	8.75
	0400 Masonry construction	↓	445	.108	↓		2.17	3.46	5.63	7.15
0500 Wood frame	↓	247	.194	↓		3.91	6.25	10.16	12.90	
612	0010 DUMP CHARGES Typical urban city, fees only									
	0100 Building construction materials				C.Y.					30
	0200 Demolition lumber, trees, brush				↓					32
	0300 Rubbish only				↓					25
	0500 Reclamation station, usual charge				Ton					60
616	0010 EXPLOSIVE DEMOLITION Large projects, not including disposal,									
	0020 based on building volume, steel building	C-17	16,900	.005	C.F.		.12		.12	.18
	0100 Concrete building	↓	16,900	.005	↓		.12		.12	.18
	0200 Masonry building	↓	16,900	.005	↓		.12		.12	.18
	0400 Disposal of material, minimum	B-3	445	.108	C.Y.		2.17	3.46	5.63	7.15
	0500 Maximum	•	365	.132	•		2.64	4.22	6.86	8.75
620	0010 RUBBISH HANDLING The following are to be added to the									
	0020 selective demolition prices									
	0400 Chute, circular, prefabricated steel, 18" diameter	B-1	40	.600	L.F.	10	11.55		21.55	29
	0440 30" diameter	•	30	.800	•	18.75	15.40		34.15	44.50
	0600 Dumpster, (debris box container), 5 C.Y., rent per week				Ea.					170
	0700 10 C.Y. capacity				↓					210
	0800 30 C.Y. capacity				↓					290
	0840 40 C.Y. capacity				↓					345
	1000 Dust partition, 6 mil polyethylene, 4' x 8' panels, 1' x 3' frame	2 Carp	2,000	.008	S.F.	.20	.19		.39	.51
	1080 2" x 4" frame	•	2,000	.008	•	.29	.19		.48	.61
	2000 Load, haul to chute & dumping into chute, 50' haul	2 Clab	24	.667	C.Y.		12.35		12.35	19.40
	2040 100' haul	↓	16.50	.970	↓		18		18	28
	2080 Over 100' haul, add per 100 L.F.	↓	35.50	.451	↓		8.35		8.35	13.10
	2120 In elevators, per 10 floors, add	↓	140	.114	↓		2.12		2.12	3.33
	3000 Loading & trucking, including 2 mile haul, chute loaded	B-16	32	1	↓		19.25	12.10	31.35	43.50
3040 Hand loaded, 50' haul	2 Clab	21.50	.744	↓		13.80		13.80	21.50	
3080 Machine loaded	B-6	80	.300	↓		6	2.51	8.51	12.10	
3120 Wheeled 50' and ramp dump loaded	2 Clab	24	.667	↓		12.35		12.35	19.40	

SITE WORK 2

020 | Subsurface Investigation and Demolition

14 of 25

020 700 | Selective Demolition

		CREW	DAILY OUTPUT	MAN-HOURS	UNIT	1993 BARE COSTS				TOTAL INCL O&P
						MAT.	LABOR	EQUIP.	TOTAL	
717	3410				Mile					4.62
	3000				Hr.					99
	6000				Ton					115
	6020									250
728	0010	B-89	775	.021	L.F.	22	.44	.34	1	1.28
	0020		1,250	.013		.05	.27	.21	.53	.70
	0400		960	.017		.26	.35	.27	.88	1.13
	0420		550	.029		.35	.61	.48	1.44	1.85
	0800	A-1A	100	.080		.24	1.48	.31	2.03	2.93
	0820		60	.133		.35	2.47	.52	3.34	4.84
	1200		146	.055		.24	1.02	.21	1.47	2.09
	1220		122	.066		.24	1.22	.26	1.72	2.45
	3020				Ea.	675			675	745
	3040					1,150			1,150	1,275
	3080					1,500			1,500	1,650
	3120					2,000			2,000	2,200
	3160					2,550			2,550	2,800
	3200					4,100			4,100	4,500
	5000	1 Carp	200	.040	L.F.		.93		.93	1.47
	5020		250	.032			.75		.75	1.17
	9950									
730	0010	A-1A	32	.250	L.F.		4.64	.98	5.62	8.35
	0040		210	.038	Ea.		.71	.15	.86	1.27
	1000									
	1040	A-1A	10	.800	L.F.		14.85	3.12	17.97	27
	1080		6	1.333			24.50	5.20	29.70	44.50

020 750 | Concrete Removal

754	0010									754
	0200									
	0240	B-9	500	.080	S.F.		1.52	.29	1.81	2.70
	0280		470	.085			1.61	.31	1.92	2.87
	0300		400	.100			1.90	.36	2.26	3.37
	0400		375	.107			2.02	.39	2.41	3.60
	0420		340	.118			2.23	.43	2.66	3.97
	0440		300	.133			2.53	.48	3.01	4.49
	1000	B-5	300	.213	L.F.		4.49	3.03	7.52	10.30
	1080		250	.256			5.40	3.64	9.04	12.35
	1120		200	.320			6.75	4.55	11.30	15.45
	1140		175	.366			7.70	5.20	12.90	17.65
	1200								10%	10%
	1220								20%	20%
	2000	A-1	200	.040	S.F.		.74	.29	1.03	1.48
	2040		190	.042			.78	.31	1.09	1.57
	2080		180	.044			.82	.33	1.15	1.65
	2100		175	.046			.85	.34	1.19	1.70
	2200								10%	10%
	2220								20%	20%
	2400	B-9	160	.250			4.74	.91	5.65	8.45
	2420		140	.286			5.40	1.04	6.44	9.65
	2440		120	.333			6.30	1.21	7.51	11.25
	2460		100	.400			7.60	1.45	9.05	13.50
	2600								10%	10%
	2620								20%	20%

SITE WORK 2

AR304194



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT

Tark's Creek FS

Decontamination of Buildings

BY RRB

DATE 4/27/93 CHKD. BY EH

DATE 5/12/93

SHEET NO. 75

OF 25

JOB NO.

Decontamination of the precious metals and old
smelter buildings

Estimated cost from vendor — \$ 80,000

Procurement of subcontractor (15%) — \$ 12,000

Contingencies & oversight (25%) — \$ 20,000

\$ 112,000

Note: Costs have not been estimated for disposal
of wash water

AR304195



Gannett Fleming
ENGINEERS AND PLANNERS

SUBJECT

Jack's Creek FS

SHEET NO.

16

OF 25

Installation of doors and locks

JOB NO.

BY RRB

DATE 4/27/93

CHKD. BY D.H.

DATE 5/12/93

Installation of doors and locks on the precious metals
and old smelter buildings

Estimated cost from vendor - \$ 10,000

Procurement of Subcontractor (25%) - \$ 2,500

Contingencies & Oversight (25%) - \$ 2,500

\$ 15,000

AR304196

GROUNDWATER / JACK'S CREEK MONITORING

AR304197



Groundwater, Surface water, Sediment, Fish Monitoring Plan

Monitoring of the deep aquifer will be conducted at onsite and offsite locations including residential wells. Assume 10 monitoring wells to be sampled bi-annually for Target Analyte List (TAL) total metals analysis. Assume 3 locations along Jack's Creek to be sampled, for surface water, sediments and fish. These locations will be sampled biannually for Target Compound List (TCL) organics and TAL metals.

There will be 5 QA / QC samples associated with each groundwater sampling event and 4 QA/QC samples associated with each surface water / sediment sampling event. Both groundwater and surface water / sediment sampling efforts will be conducted at the same time.



Level of Effort

① Mobilization / Demobilization

- Assume 60 hrs / trip (30 hrs mobilization, 30 demobilization)
- Assume 1 person
- @ \$45 per hour + 12 hrs Clerical @ \$22 per hr
- Totals \$2,964 per trip

② Groundwater and Surface Water / Sediment / Fish Sampling

- Assume 5 days of sampling
- Assume 10 hrs / day
- Assume 5 people
- Assume 6 hours round trip travel
- 250 hrs sampling + 30 hrs travel = 280 hrs
- @ \$45 per hour
- Totals \$12,600 per trip



③ Groundwater Data Validation

- 15 Samples per trip
- 1 hour per sample for inorganics validation
- 20% for review
- Totals 18 hours @ \$ 45 per hour
+ 6 hrs (Clerical) @ \$ 22 per hour
- NET TOTAL \$ 942 per trip

④ Surface water & Sediments Data Validation

- 13 Samples for organics @ 2 hrs per sample
- 13 Samples for inorganics @ 1 hr per sample
- 20% for review
- Totals 47 hours @ \$ 45 per hour
+ 8 hrs (Clerical) @ \$ 22 per hour
- Net total \$ 2,282 per trip

⑤ Groundwater, Surface water, Sediments, ^{and Fish} Data Tabulation

- Assume 80 hours per trip for 1 person
- @ \$ 45 per hour
- Totals \$ 3,600 per trip



Other Direct Cost

⑥ Transportation

- Assume 2 vehicles @ 300 miles x 0.28 \$ per mile
- \$ 168 per trip for both vehicles

$$\text{Totals} \approx \$ 150 \times 1.1 (\text{Fee}) = \underline{\underline{\$ 185}}$$

⑦ Living, meals & incidentals

- Assume 5 people
- Assume 5 days per trip
- \$ 66 per diem per 1992 CONUS rate

$$\text{Totals} \quad \underline{\$ 1650} \times 1.1 (\text{Fee}) = \underline{\underline{\$ 1,815}}$$

⑧ Miscellaneous ie. Sample shipping, overnight letter and packages photocopying, materials and supplies.

- Assume \$ 2000 per trip

$$\text{Totals} \quad \underline{\$ 2000} \times 1.1 (\text{Fee}) = \underline{\underline{\$ 2,200}}$$

⑨ Laboratory Costs

- Cost were taken from Gannett Fleming's Environmental Laboratory 1992 Fee Schedule except for fish samples

AR304201

- 15 Groundwater samples for TAL metals (including QA/QC)
@ \$ 450 per sample
- 5 Surface water samples for TCL organics (including QA/QC)
@ \$ 1210 per sample
- 5 Surface water samples for TAL metals (including QA/QC)
@ \$ 450 per sample
- 5 Sediment samples for TCL organics (including QA/QC)
@ \$ 1300 per sample
- 5 Sediment samples for TAL metals (including QA/QC)
@ \$ 450 per sample
- 3 Fish Samples for TAL metals (@ \$ 1200 per sample) & TCL Organics (@ \$ 2000 per sample)
- Groundwater samples total \$ 6,750
- Fish samples total \$ 9,600
- Surface water / Sediment samples total \$ 17,050
- Total 38 samples x \$ 250 / sample for CLP paperwork = \$ 9,500
- Totals \$ 42,900 x 1.1 (Fee) = \$ 47,190

SUM TOTALS

- ① Mobilization / Demobilization \$ 3,000
- ② Groundwater and Surface Water / Fish /
Sediment Sampling \$ 13,000
- ③ Groundwater Data Validation \$ 1,000
- ④ Surface water / Fish / Sediments Data Validation \$ 2,300
- ⑤ Groundwater, Surface water & Sediment
Data Validation \$ 3,600

- ⑥ Transportation \$ 200
- ⑦ Living, meals & incidentals \$ 1,800
- ⑧ Miscellaneous items \$ 2,200
- ⑨ Laboratory Costs \$ 47,000

TOTAL COST PER SITE VISIT \$ 74,100.

ESTIMATED COST FOR FIRST - YEAR

say 74,000
148,000

Note: A capital cost of \$ 10,000 is estimated for preparation of a health and safety plan and work plan.

**CHEMICAL FIXATION OF SOILS ACROSS THE SITE
AND THE WASTE PILES**

AR304204



Chemical Fixation of Soils in Active Scrap Yard,
and around
Soils in Fenced Area, and Waste Piles

Estimated quantities:

Active Scrap Yard — 150,000 tons

In and around Fenced Area — 270,000 cy

Assume $1.5 \frac{\text{tons}}{\text{cy}}$ = 405,000 tons

Waste piles — 140,000 tons (ball mill tailings)
— 5,000 cy (aluminum dross)
Assume $1.5 \frac{\text{tons}}{\text{cy}}$ = 7,500 tons

Total Volume to be treated = $150,000 + 405,000 + 140,000 + 7,500$
= 702,500 tons

Vendor estimates for treating materials = \$50 / ton
(Soil Safe & Driggs Corporation)

Total Cost for Treatment = \$35,100,000
Pilot Study = \$100,000
Bench Study = \$10,000
\$35,210,000

Procurement of contractor (0.05%) = \$176,050
Contingencies & oversight (0.1%) = \$352,100
\$35,738,150
say \$36,000,000

Notes: The economic impact of not having the scrap yard operating at its full potential has not been considered

No residuals are expected to be generated from the treatment process based on conversations with the vendor

**CHEMICAL FIXATION OF SOILS ACROSS
THE SITE, WASTE PILES, AND DREDGED SEDIMENTS**

AR304206

Chemical Fixation of Soils in Active Scrap Yard
and around
Soils in Fenced Area, Waste Piles and Dredged Sediments

Estimated quantities:

Active Scrap Yard — 150,000 tons

In and around Fenced Area — 270,000 cy

Assume $1.5 \frac{\text{tons}}{\text{cy}}$ = 405,000 tons

Waste piles — 140,000 tons (ball mill tailings)
— 5,000 cy (aluminum dross)
Assume $1.5 \frac{\text{tons}}{\text{cy}}$ = 7,500 tons

Dredged Sediments — 500 cy or 750 tons
Total Volume to be treated = $150,000 + 405,000 + 140,000 + 7,500 + 750$
= 703,250 tons

Vendor estimates for treating materials = \$50 / ton
(Soil Safe & Driggs Corporation)

Total Cost for Treatment = \$35,162,500
Pilot Study = \$100,000
Bench Study = \$10,000
\$35,272,500

Procurement of Contractor (0.05%) = \$176,362
Contingencies & oversight (0.1%) = \$352,725
say \$36,000,000 \$35,801,587

Notes: The economic impact of not having the scrap yard operating at its full potential has not been considered

No residuals are expected to be generated from the treatment process based on conversations with the vendor

AR304207

DREDGING OF JACK'S CREEK SEDIMENTS

AR304208



Dredging of Jack's Creek Sediments

Based on HNUS / GF volume estimate = 500 cy or 750 tons

$$750 \text{ tons} \times \$ 25 / \text{ton} = \$ 18,750$$

(Vendor estimate)

$$\begin{aligned} \text{Procurement of Subcontractor (1\%)} &= \$ 1,875 \\ \text{Contingencies \& Oversight (5\%)} &= \$ 9,375 \\ &= \underline{\underline{\$ 30,000}} \end{aligned}$$

The dredged sediments would be treated onsite along with the soils and waste piles.